

Serial No. 10/739,229

Atty. Docket 29936/39870

REMARKS

This paper is being presented in response to an official action dated March 3, 2003, wherein claims 1-4 were pending; the specification was objected to; the abstract was objected to; and claims 1-4 were rejected under 35 U.S.C. § 102(b).

The applicant has carefully reviewed and considered the official action and the references cited therein.

Brief Summary of the Amendments

Claim 1 has been amended to recite the step of "performing a nitrogen ion implantation process after the formation of the gate oxide film and the polysilicon film." Support for the amendment can be found in the specification, in Fig. 2B and at paragraph [0020], for example. Claims 2-4 have been amended to refer to the antecedent "semiconductor device" in claim 1.

Entry of the amendments to the specification and claims 1-4, reconsideration of the rejected claims, and allowance of all pending claims 1-4 are respectfully requested in view of the following remarks.

Objection to the Specification

At page 2, line 22, the specification was objected to on the basis that the initialism "HDP" should be recited in full as "High density Plasma." The paragraph has been amended accordingly, and the objection can be withdrawn.

Objection to the Abstract

The abstract was objected to on the basis that it contained "legal phraseology such as 'comprise.'" The paragraph has been amended accordingly, and the objection can be withdrawn.

Rejections under 35 U.S.C. § 102(b)

Claims 1-4 were rejected under 35 U.S.C. § 102(b) in view of Gousev et al. U.S. Patent No. 6,287,897 B1.

Claim 1, as amended, now recites a step of performing a nitrogen ion implantation process after the formation of the gate oxide film and the polysilicon film. In contrast, Gousev et al. does not teach or even suggest a nitrogen ion implantation process after the formation of the polysilicon film. Instead, Gousev et al. merely describes performing the

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nitrogen ion implantation process at the gate oxide film before the formation of the polysilicon layer. The nitrogen ion implantation process of the claims is performed after the formation of the polysilicon layer. The nitrogen ion implantation process of Gousev et al. is performed before the formation of the polysilicon layer.

Claims 2-4 depend from base claim 1. Accordingly, all claims 1-4 are in condition for allowance over Gousev et al. Reconsideration and withdrawal of the rejection on this basis are requested.

Rejections under 35 U.S.C. § 102(e)

Claims 1-4 were rejected under 35 U.S.C. § 102(e) in view of Jeng U.S. Patent No. 6,562,730 B2.

Claim 1, as amended, now recites a step of performing a nitrogen ion implantation process after the formation of the gate oxide film and the polysilicon film. In contrast, Jeng does not teach or even suggest a nitrogen ion implantation process after the formation of the polysilicon film. Instead, Jeng describes formation of a first silicon layer 56 and then a second barrier layer 58, followed by nitrogen ion implantation into the second barrier film 58 (see column 4, line 30, to column 5, line 50, particularly at column 5, lines 33-47).

Also, with respect the claim 1, the claim recites a step of performing a thermal treatment process to form barrier layers by combination of oxides and nitrogen at an interface between the semiconductor substrate and the gate oxide film, and at an interface between the gate oxide film and the polysilicon film. In contrast, Jeng does not teach or even suggest the barrier layers by combination of oxides and nitrogen at the interface between the semiconductor substrate and the gate oxide film, and at the interface between the gate oxide film and the polysilicon film. The reliance on Figures 3 and 4 of Jeng for such disclosure is misplaced -- see the corresponding specification of Jen a column 4, line 30, to column 5, line 50).

Claims 2-4 depend from base claim 1. Accordingly, all claims 1-4 are in condition for allowance over Jeng. Reconsideration and withdrawal of the rejection on this basis are requested.

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CONCLUSION

In the absence of more pertinent prior art, withdrawal of the rejections and allowance of all pending claims 1-4 are respectfully requested.

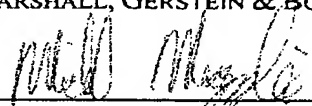
Should the examiner wish to discuss the foregoing, or any matter of form or procedure in an effort to advance this application to allowance, the examiner is urged to telephone the undersigned attorney at the indicated number.

Respectfully submitted,

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By



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